SEMESTER EXAM, DECEMBER-2022

Course Name:-B.Tech **Semester:- FIRST**

Paper Name:- Fundamentals of Electronic Engineering **Paper Code:-TES 105**

समय– 2 घण्टे, 20 मिनट प्रति घंटे अतिरिक्त–दृष्टिबाधित एवं सह लेखक परीक्षार्थियों के लिए। अधिकतम अंक–70

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries**04** marks. All questions are compulsory.
- Section B- Answer any **2 out of 4** given questions in maximum one hundred fifty**(150) words**. Each question carries **10 marks**.
- SectionC- Answer any **2 out of 3** given questions in maximum two hundred fifty **(250) words**. Each question carries **15 marks**.

निर्देश:

- प्रश्न पत्र में तीन खण्ड अ, ब, व स हैं। सभी खण्ड अनिवार्य हैं।
- खण्ड–अ में प्रत्येक प्रश्न **चार** अंक का है। सभी प्रश्न अनिवार्य हैं।
- खण्ड–ब में **चार** प्रश्नों में से किन्हीं**दो** प्रश्नों के उत्तर अधिकतम **डेढ़ सौ** (150) **शब्दों** में दें। प्रत्येक प्रश्न 10 अंक का है।
- खण्ड–स में **तीन** प्रश्नों में से किन्हीं**दो**प्रश्नों के उत्तर अधिकतम **ढाई सौ**(250) **शब्दों** में दें। प्रत्येक प्रश्न 15 अंक का है।

Section – A (खण्ड–अ)

Objective Questions (वस्तुनिष्ठप्रश्न)

1. Answer all the following questions. **5×4=20**

निम्नलिखित सभी प्रश्न अनिवार्य हैं।

i) Gray code conversion of Binary code 11001 is_____

a) 11101
b) 10101
c) 01101
d) 00101

ii) Peak Inverse Voltage (PIV) of HWR is _____

a) Vm **b)** 2Vm **c)** 3Vm **d)** None

iii) Which of the following statements is not correct for an operational amplifiers?

a) The input resistance is infinite
b) Gain is infinite
c) The output resistance is infinite
d) Bandwidth is infinite

iv) How many valence electrons do a trivalent impurities have_____

a) 4 **b)** 5 **c)** 3 **d)** 2

v) A transistor has β 250 and base current I_B 20μA. The collector current I_C is___

a) 500μA
b) 5mA
c) 50mA
d) 5A

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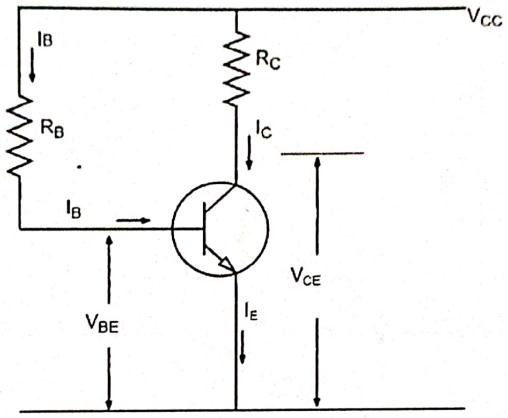
Section – B (खण्ड–ब)

Short Answer Questions (लघुउत्तरीय प्रश्न)

2. Answer any two of the following questions in maximum 150 words. **2×10=20**

निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें।

i) A base resistor biasing circuit is shown in figure below. Determine collector current I_C and collector emitter voltage V_{CE}?. (assume V_{CC} = 10V, R_B=200kΩ, R_C=300Ω, V_{BE}=0.6V and β=60).



ii) What do you mean by Zener Diode?. Distinguish between zener breakdown and avalanche breakdown.

iii) Explain the difference between intrinsic and extrinsic semiconductors with examples.

iv) What is K-Map?. Draw Two, Three, Four variable K-map. Also minimise Boolean function F(A,B,C)=∑m(0, 1, 2, 4, 5) using k-map.

Section – C (खण्ड–स)

Descriptive Questions (विवरणात्मकप्रश्न)

3. Answer any two of the following question in maximum 250 words. **2×15=30**

निम्नलिखित में से किन्हीं दोप्रश्नों के उत्तर अधिकतम 250 शब्दों में दें।

i) What do you mean by clipper circuits?. List different types of clippers. Also write application of clipper circuits.

ii) What are the main application areas of semiconductor diodes?. Define the term 'rectification'. Draw the circuit diagram and input output waveform of Half Wave Rectifier (HWR). What do you mean by rectification efficiency?.

iii) **a)** Find the voltage at which the reverse current in a Ge diode at room temperature will reach 90% of its saturation value?. **b)** Find the ratio of diode current with a forward bias of 0.05V to the current with a reverse bias of 0.05V?. **c)** The reverse saturation current of a Ge diode is 10μA. Find current under forward biases of 0.1V, 0.2V, 0.3V.

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